

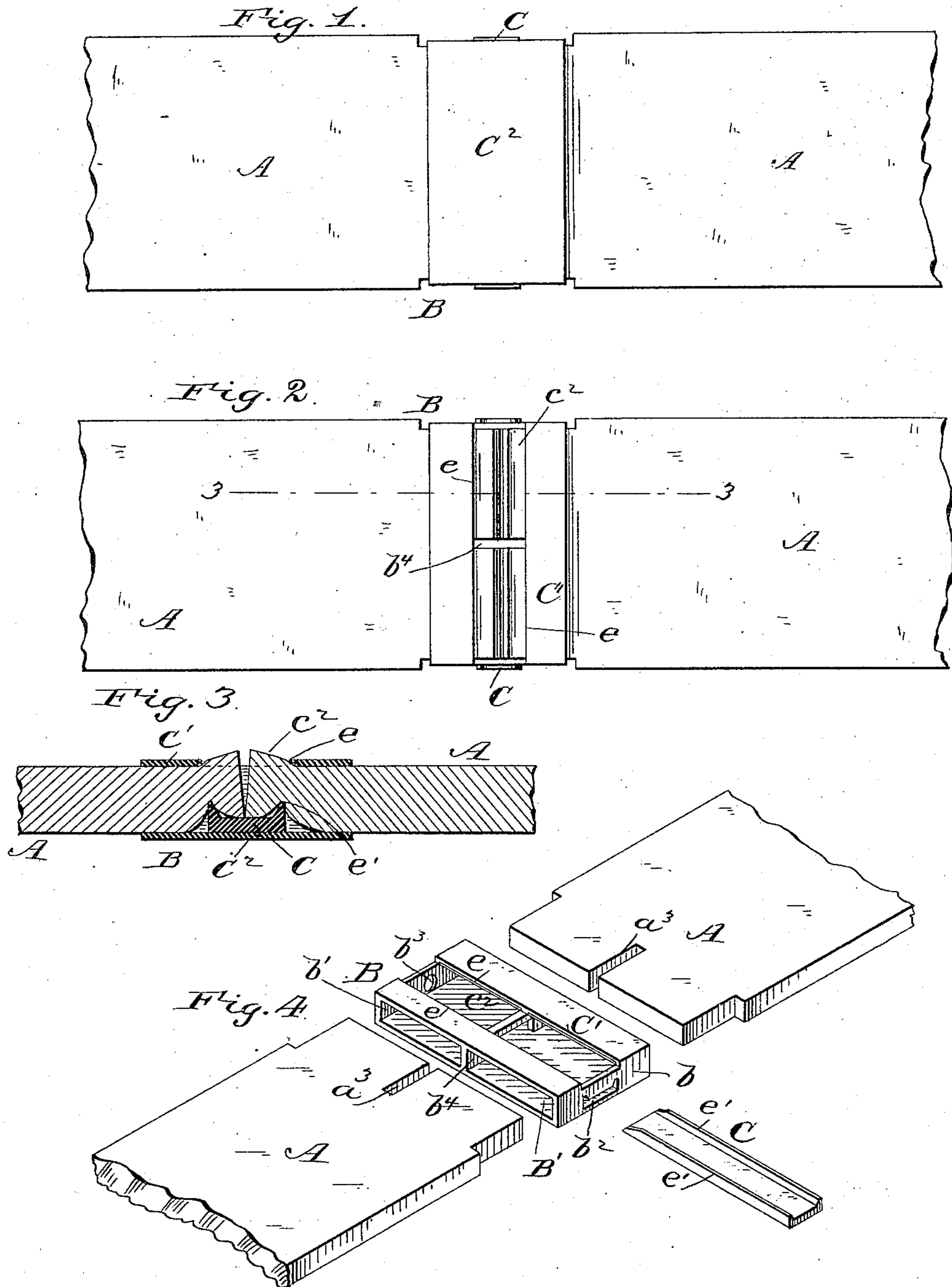
(No Model.)

3 Sheets—Sheet 1.

A. K. NORRIS.
BELT FASTENER.

No. 307,490.

Patented Nov. 4, 1884.



witnesses:
Chas. S. Hyer.
E. D. Smith

Inventor:
Albion K. Norris,
by N. N. Low
Atty.

(No Model.)

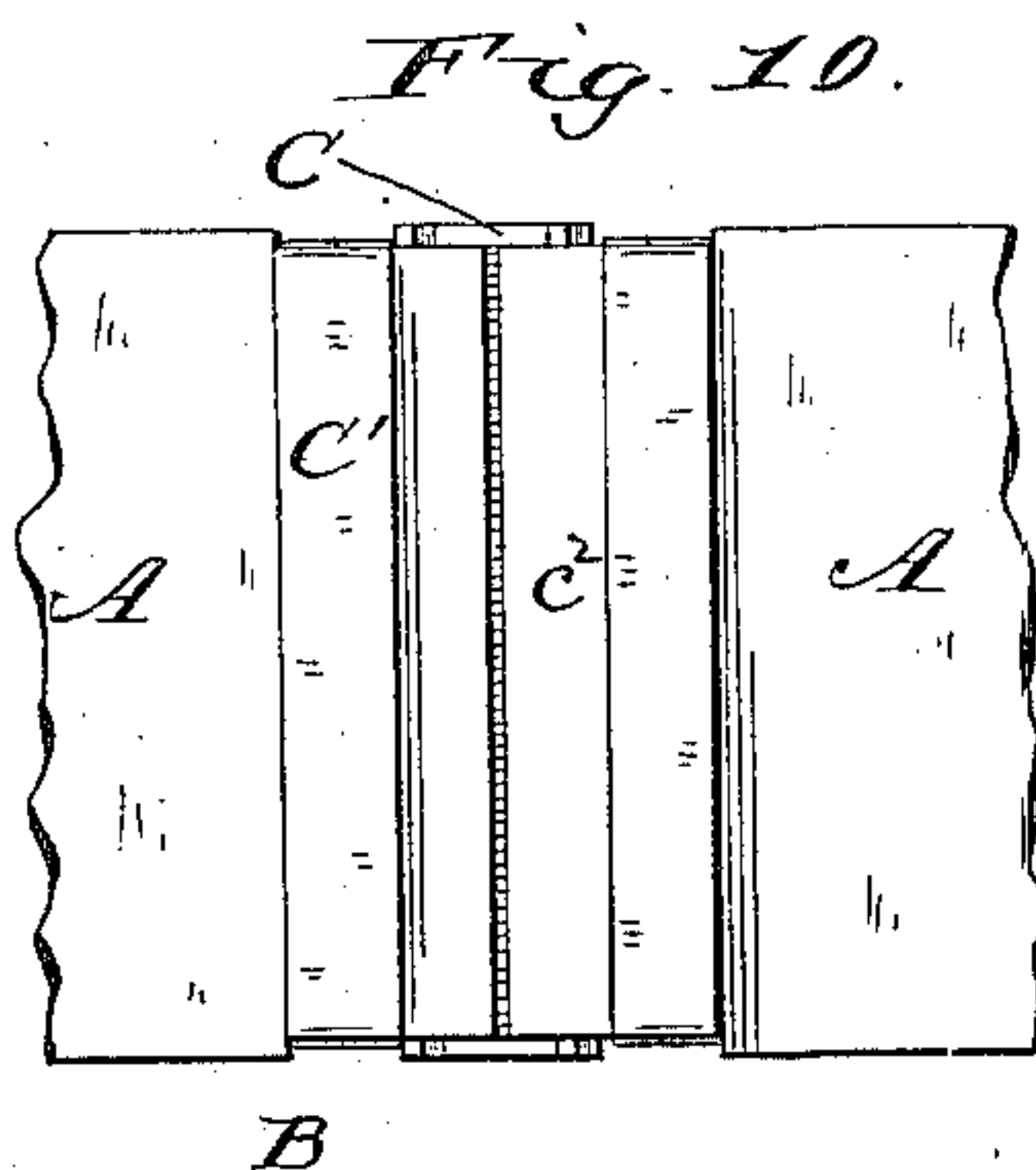
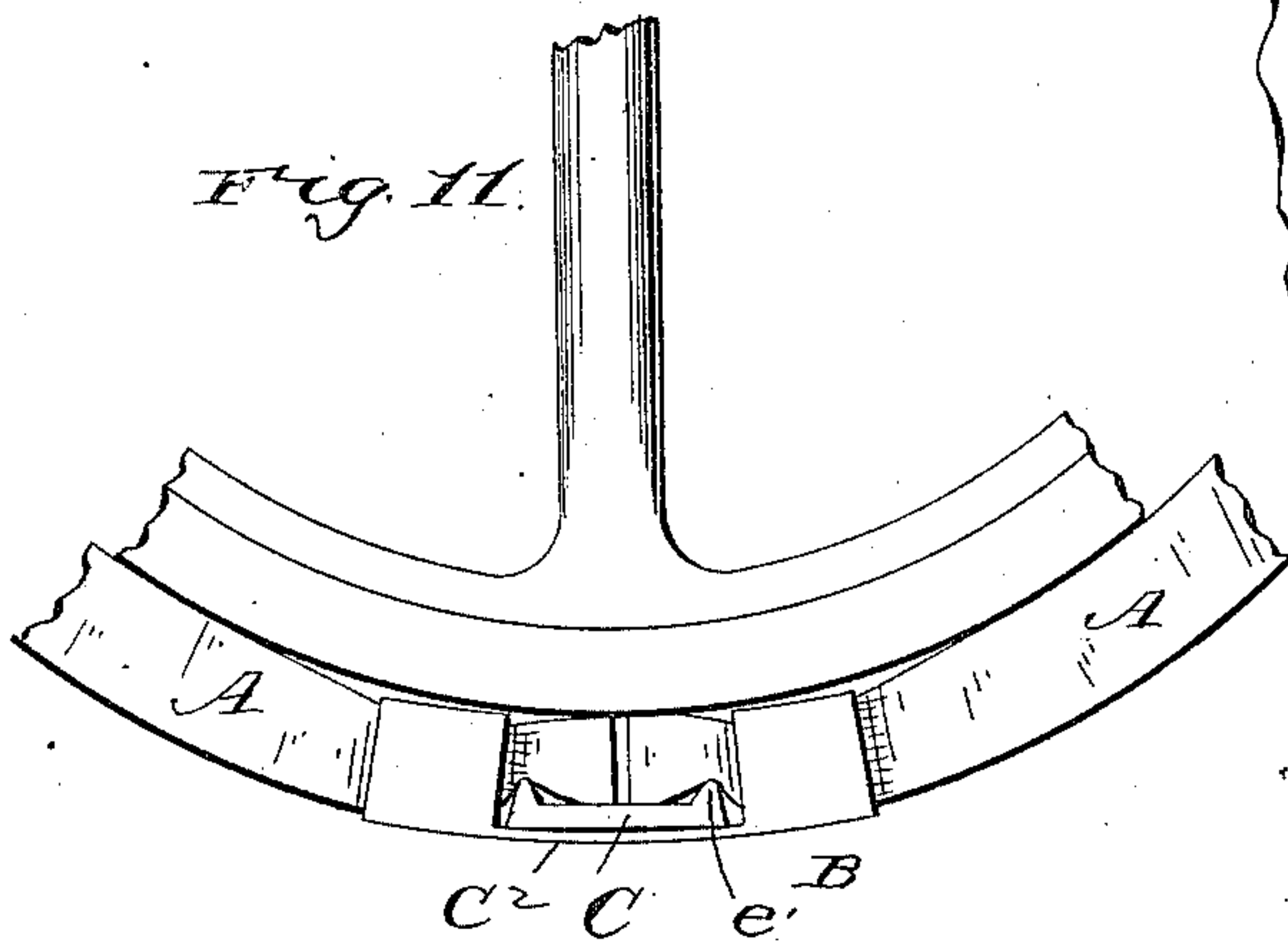
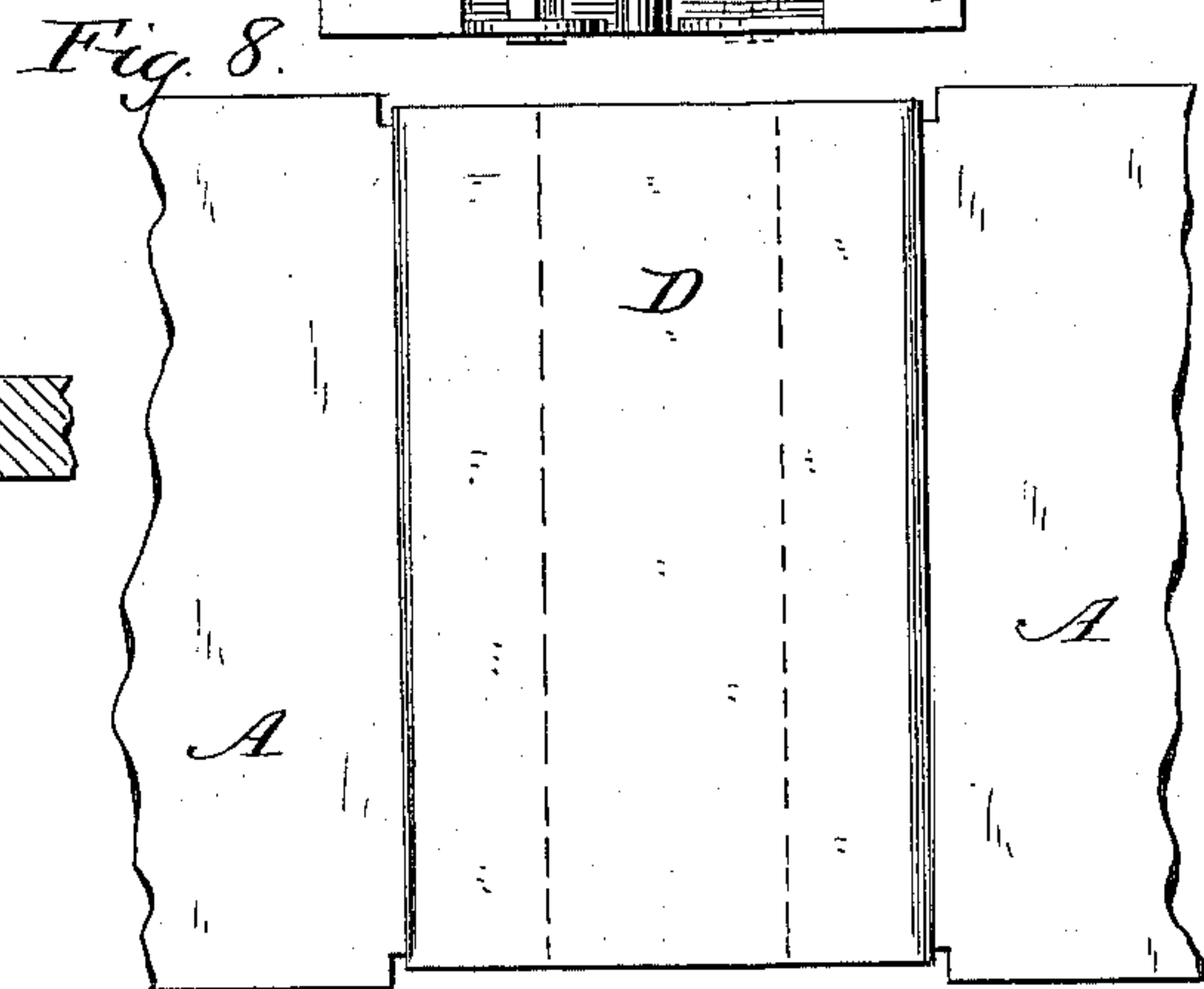
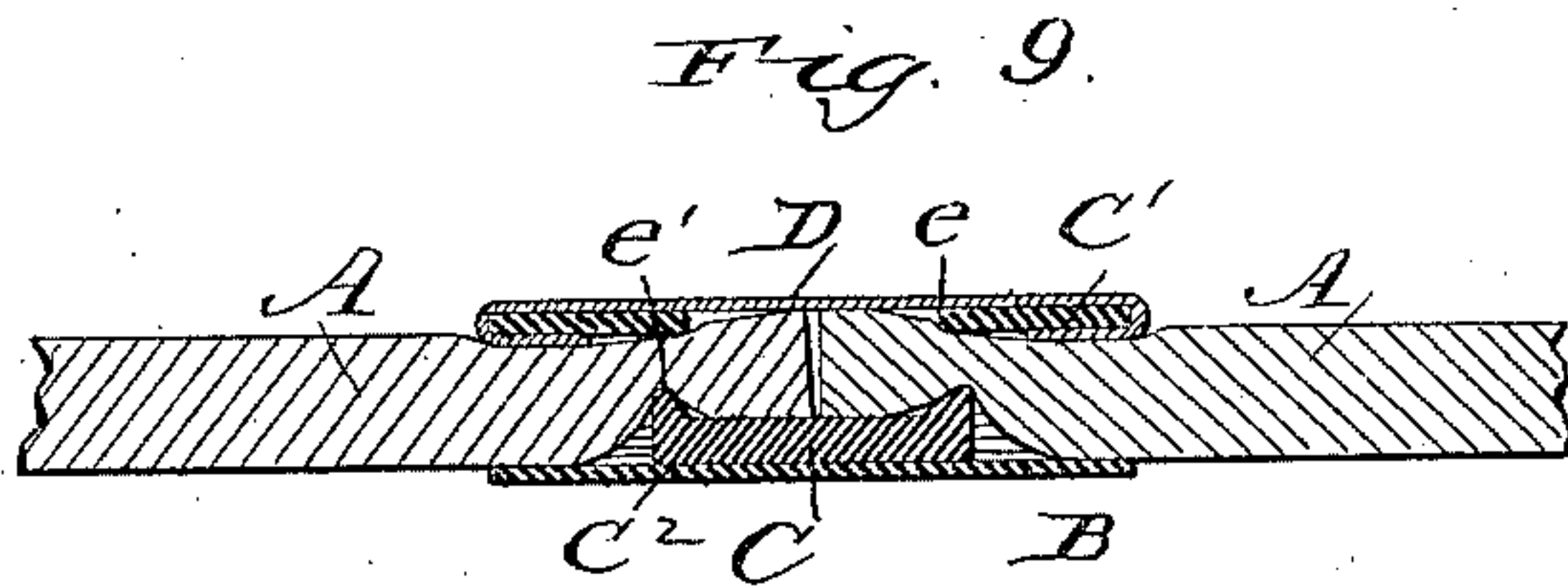
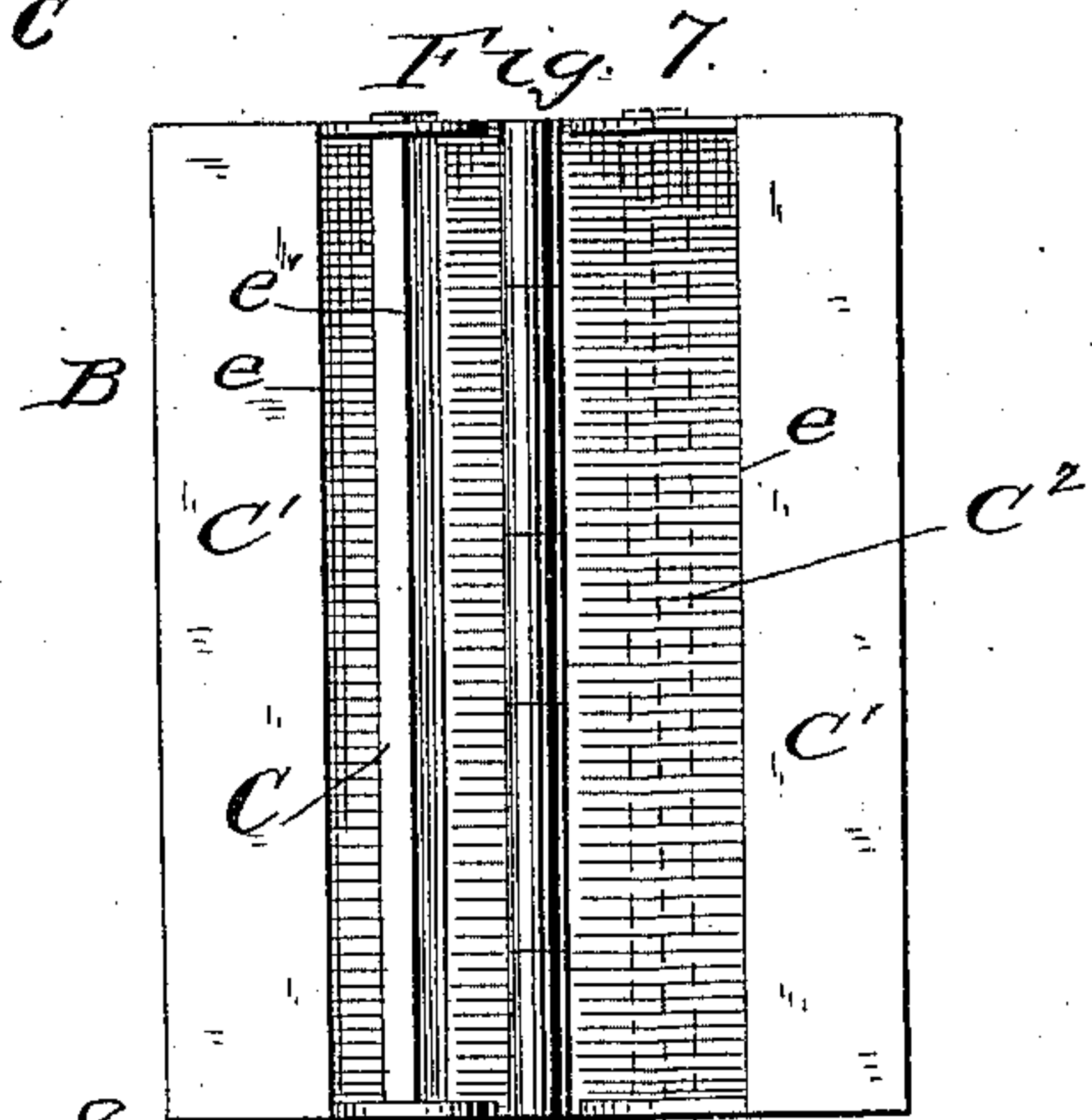
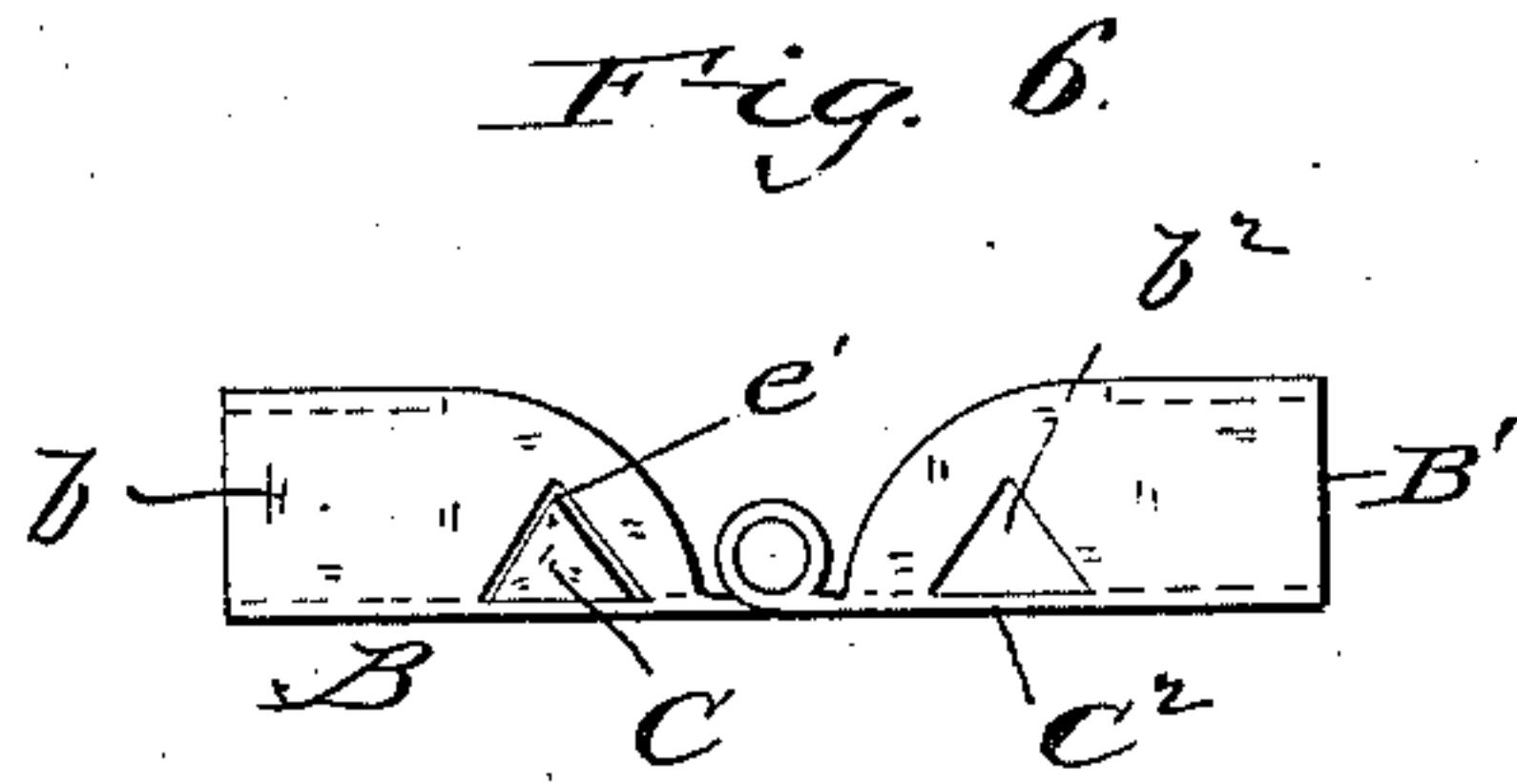
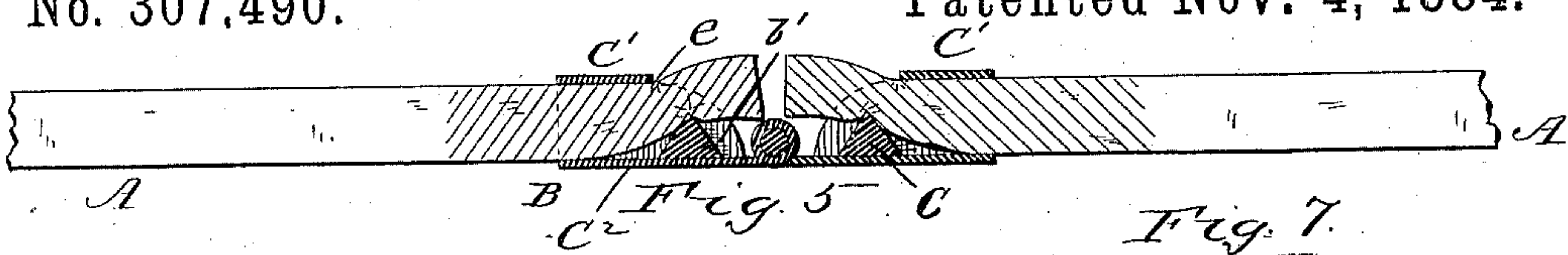
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Inventor:

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by A. N. Low
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(No Model.)

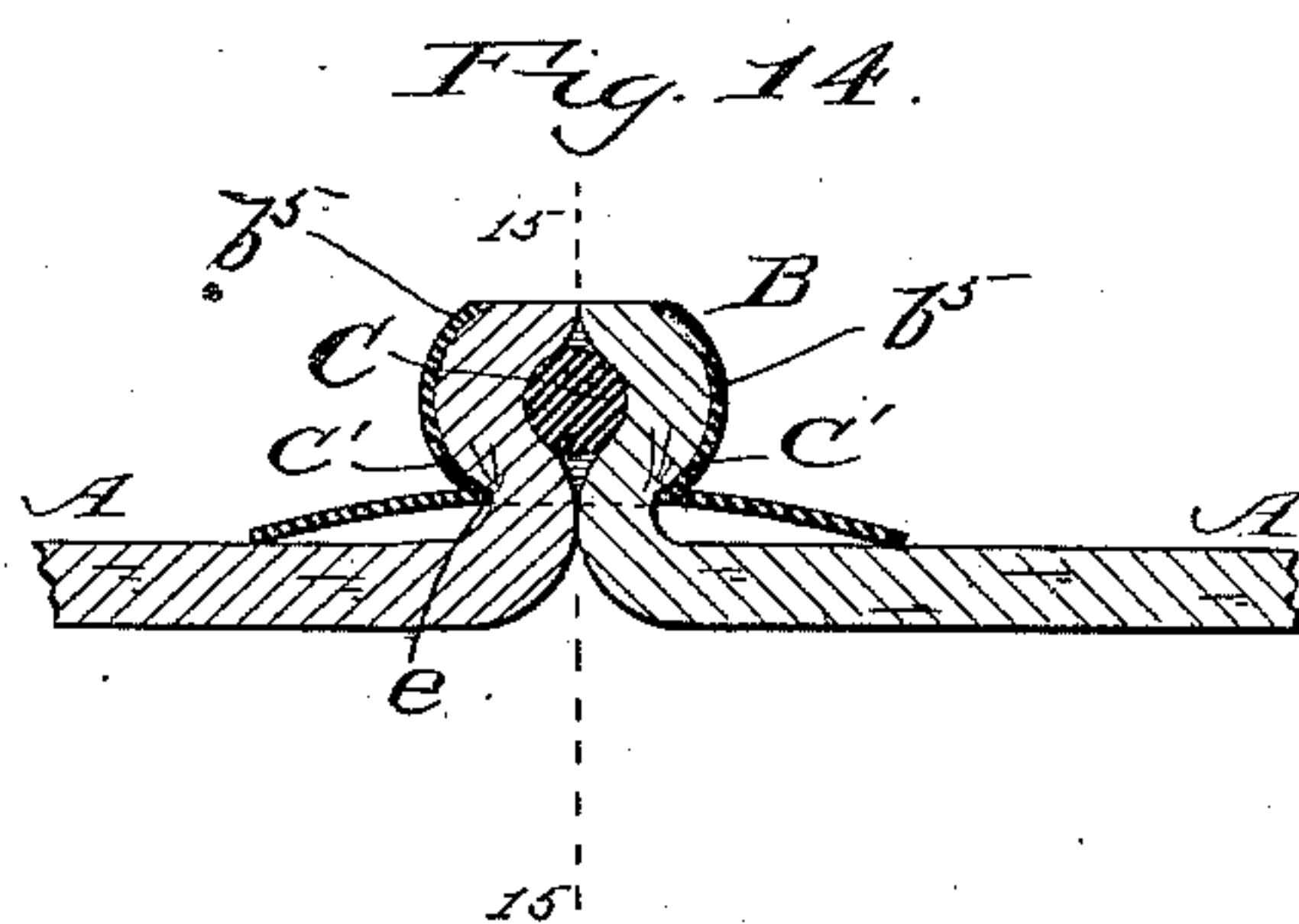
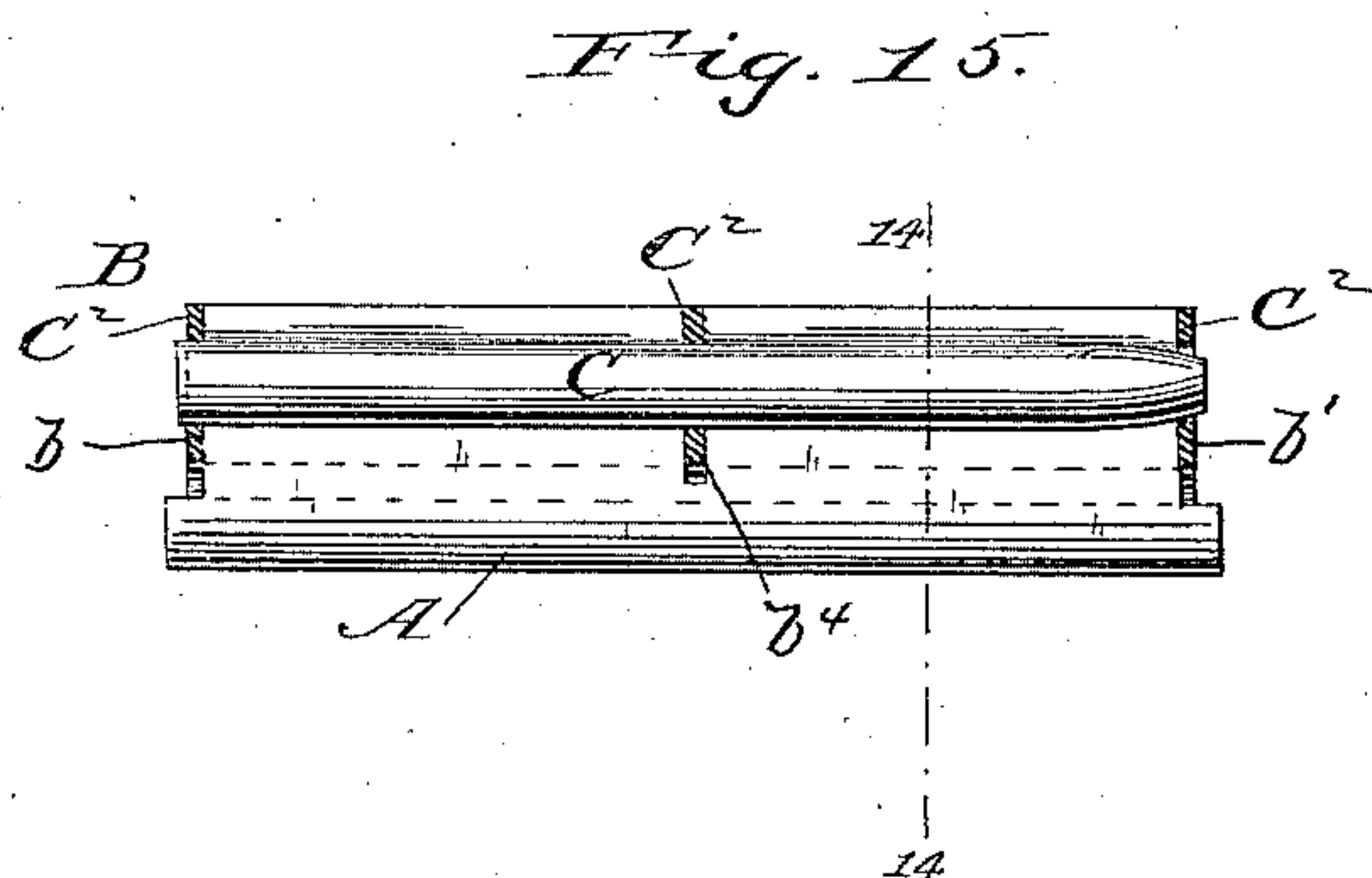
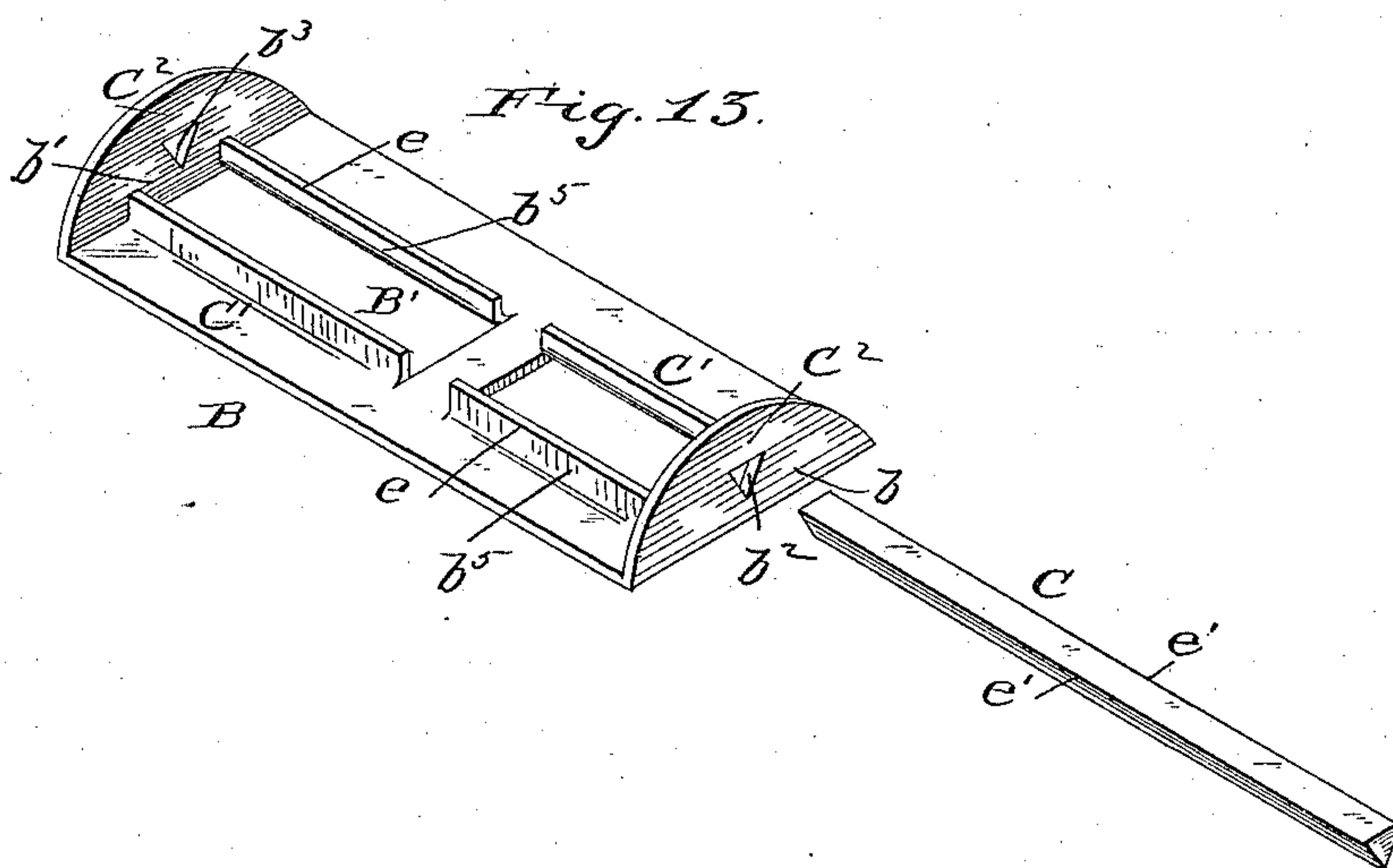
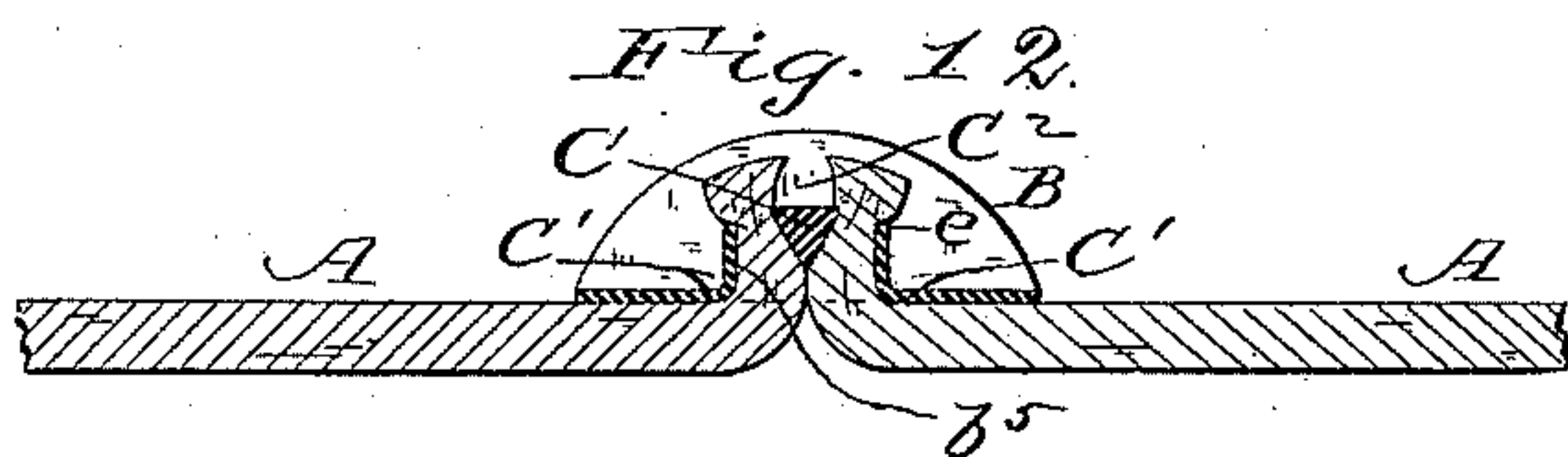
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A. K. NORRIS.

BELT FASTENER.

No. 307,490.

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Witnesses:
Chas. S. Hyer.
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UNITED STATES PATENT OFFICE.

ALBION K. NORRIS, OF HOUSTON, TEXAS, ASSIGNOR TO NATHAN MORSE,
OF BOSTON, MASSACHUSETTS.

BELT-FASTENER.

SPECIFICATION forming part of Letters Patent No. 307,490, dated November 4, 1884.

Application filed March 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALBION K. NORRIS, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Belt-Fasteners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same.

My invention relates to such clamps or fasteners as are used for uniting the ends of power-transmitting belts or bands.

The object of the invention is to provide a fastener by which the ends of a belt may be quickly united and firmly held and the belt tightened to the exact degree desired without cutting holes in it. At the same time the full strength of the belt may be preserved, as by this fastener the ends of the belt may be united without cutting them in any way; or for certain purposes the ends of the belt may be cut, as will be hereinafter described. To this end I surround the ends of the belt to be united with a clip or frame of suitable material, preferably of malleable steel, and insert through a side aperture in this frame, transversely across the ends of the belt, a keeper or key. The result attained is that the ends of the belt are confined between the frame and the key so tightly that it is practically impossible to draw them out longitudinally. A frame and key of the above description can obviously be made in various different forms, each having the peculiar advantages in cheapness of construction, convenience of use, or efficiency of operation, which arises from the details of its construction.

For the purpose of clearly illustrating and describing my invention I have shown in the accompanying drawings those modes of carrying it into effect which I deem most advantageous.

In said drawings, Figure 1 is a plan view of the ends of a belt and the frame, showing the former inserted longitudinally into the latter. Fig. 2 is a view of the same from the opposite side. Fig. 3 is a longitudinal section enlarged, on line 3-3, Fig. 1. Fig. 4 is a perspective view of the same parts separated. Fig. 5 is a longitudinal section of the belt and fastener, the

latter being made in two parts hinged together, the key being also made in two parts. Fig. 6 is a side view of said two-part frame. Fig. 7 is a plan view of the same. Figs. 8 and 9 illustrate a method of covering the frame with a facing of soft material. Figs. 10 and 11 show a simplified construction of the frame suitable for small belts. Figs. 12 and 13 show a structure of the frame into which the ends of the belt are inserted at right angles to their normal position. Figs. 14 and 15 show another form of the same.

A A represent the two ends of the belt, B the surrounding frame, and C the keeper or key. The frame B, having an aperture, B', through which the ends of the belt are to be inserted, portions C' C', against which said ends are to be clamped, and a part or parts, C², which hold the key against the belt, may be made of any suitable material having the requisite strength. I prefer a good quality of steel, as it is desirable that the fastener should be as thin and light as is compatible with strength. It may be cast in form or struck from thin malleable metal.

It will be understood that the fastener is to be made of various sizes to correspond approximately with the sizes of belting as ordinarily supplied.

The key may be made of any suitable material. It is constructed by preference of substantially uniform cross-section from end to end, so as to clamp the whole width of the belt uniformly, being made slightly tapering at the end which is first inserted in order to facilitate the operation of fastening. It should be of such thickness as to fit tightly when driven into place. It will be understood that this key may be made in two parts which engage each with one end of the belt, as shown in Figs. 5, 6, and 7; but it will generally be more convenient to so construct and locate one key that it may engage with both ends of the belt.

It is desirable to so construct the frame, or the key, or both, that they may present comparatively sharp edges *e e'* to the surface of the belt, to insure that it shall be firmly held. These edges preferably are not sharp enough to cut the fiber of the belt, but rather to indent and become embedded in its surface.

Referring now to details of the forms of fastener into which the ends of the belt enter longitudinally, (shown in Figs. 1 to 11,) it will be seen that the frame thereof consists, essentially, of the two portions or plates C' C'' , adapted to bear against the upper and lower surfaces of the belt, and connecting-pieces, which hold said plates C' C'' together against the strain caused by the compression of the ends of the belt which tends to separate them. If both of the plates C' C'' are made plain, without the transverse opening c'' or other means of forming transverse edges e , the key C should have the edges e' for engagement with the belt. Where, however, one of the plates C' C'' has the opening c'' , or has inwardly-projecting edges similar to those shown at e' , the key C may be made plain without edges e' ; but I prefer both to make an opening, c'' , in one of the plates of the frame and to form the key with edges e' , for the greater efficiency of the device. The pieces which connect the plates C' C'' may be so disposed as to serve other useful purposes. Thus they may be placed one at each side of the frame B , as shown at b' , to confine the belt from transverse movement, provided that an aperture is left, as at b'' , for the insertion of the key C . An opposite aperture, b''' , is also preferably provided for the insertion of an instrument to force out the key when desired.

In addition to the pieces b' , an intermediate piece, b^4 , parallel with the belt, may connect the plates c' c'' at the middle to prevent their springing apart at that point where the frame is of considerable width, and to assist in keeping the belt in place and prevent its being crowded to the opposite side of the frame when the key is driven in. When this intermediate piece is used, the belt must be slit longitudinally, as shown at a^3 .

If desired, the ends of the belt may be shaved on their edges or otherwise reduced in width so that they will enter a fastener that is narrower than the belt. The advantage of this is that the fastener will not then be liable to strike against any object situated at the side of the belt—as, for instance, the flange of a grooved pulley—while the disadvantage is that the belt is somewhat weakened by thus reducing the stock in it.

The conditions under which the belt is to be run will determine whether it is better to use a fastener that is narrower than the belt or one large enough to contain its full width.

In Figs. 5, 6, and 7 I have shown a frame, B , composed of two parts hinged together transversely, to give it flexibility in passing around the band-pulley. In such case the key also may be made in two parts, as shown in said figures.

In using the forms of fastener shown in Figs. 1 to 11, I prefer when they are constructed with the opening c'' to run that face of the fastener which has said opening next to the band-pulley, as the key C forces the ends of the belt

outward and through said opening to some degree, so as to materially assist in keeping the face of the frame from contact with the pulley, as shown in Fig. 11. The degree to which the ends of the belt will be forced outward will be increased by forming the edges e with rabbets, as shown in Fig. 3, which practically tapers them off outwardly, and at the same time preserves or increases the capacity of said edges to firmly hold the belt. It may, however, be desirable to cover the entire surface of that plate of the frame B which is to run next to the pulley with a soft material, such as leather. It will be seen by reference to Figs. 8 and 9, that this may be done with great convenience by forcing the opposite edges of this material D into the fastener-frame at the same time that the belt is inserted, and clamping the belt and the material D by the insertion of the key C .

The construction of the fasteners shown in Figs. 12 to 15 will be readily understood without detailed explanation. These, of course, are not suitable to be used where an intermediate pulley bears against the outer surface of the belt.

The form illustrated by Figs. 12 and 13 may be struck out of thin malleable metal at very slight cost. The ends of the belt are to be inserted into the frame B at right angles to their normal position. The key C is then driven through the aperture b'' , so as to crowd the ends of the belt, one to each side, against the frame B . The key will then be held by its engagement with the frame B , and its tendency to fly out tangentially as it passes at high speed around a pulley obviated. The other functions of the parts b' b'' b''' b^4 e' have already been described. If desired, the metal struck out from the aperture B' may be turned up to form lips b^5 , to give the frame B additional stiffness; but such lip may be dispensed with.

In Figs. 14 and 15 the upwardly-extending lips b^5 are higher than the line of insertion of the key C and are concave on their inner faces. The key C is correspondingly convex, and the belt is thus forced into a curved position (see Fig. 14) and very securely held.

I am aware that fasteners have been heretofore constructed to hold the ends of a belt turned up at substantially a right angle to the normal line of the belt by means of a surrounding frame and a key adapted to be inserted into the angle between said ends on lines perpendicular to the surface of the belt, and to be held in place by points which penetrate the belt; and I do not claim such construction as my invention.

What I claim is—

1. In a belt-fastener, the combination, with a frame having an aperture for the admission of the belt, and constructed to surround the same, and having a side aperture for the insertion of a key, of a key adapted to be driven

transversely across said belt to confine it between the key and the frame, substantially as set forth.

2. In a belt-fastener, the combination, with
5 a frame having an opening for the admission of the belt, portions constructed to pass across the upper and lower faces of the same, and rigid connections between said upper and lower portions, of a key having edges project-
10 ing from its surface, and adapted to be driven between said frame and the belt transversely of the latter, with said projecting edges in contact with and partially embedded in the surface of the belt, substantially as set forth.

15 3. In a belt-fastener, the combination, with a frame having portions constructed to pass across the upper and lower faces of the belt, and rigid connections between said upper and lower portions, said frame also having trans-
20 verse edges adapted to engage with and become embedded in the surface of the belt, of

a key constructed to be driven between the belt and the frame to force the former against said edges, substantially as set forth.

4. In a belt-fastener, the combination, with
25 a frame having portions constructed to pass across the upper and lower faces of the belt, one of said portions having a transverse opening, of a key having projecting edges and adapted to be driven transversely between one
30 of said portions of the frame and the belt, upon the opposite side of the latter from said opening, whereby the belt may be held between said key and the edges of the opening, substantially as set forth.

35 In testimony whereof I affix my signature in presence of two witnesses.

ALBION K. NORRIS.

Witnesses:

EWELL A. DICK,
H. N. LOW.